SUKHORUKOV, B. I., etal., Doklady Akademii Nauk SSSR, 1973, Vol 208, No 2, pp 443-446

The notation in parentheses give the atoms and atomic groupings which distinguish the given analogs from the indicated bases. The position of the atom in the ring is given by the superscript, and atoms outside the ring are recorded following the ring to which they are attached without a superscript. Numbering of ring atoms is such that desoxyribose is always attached in the third position of the analogs of pyrimidines, and in the ninth position of analogs of purines. Calculations showed that for all five compounds the average energies of interaction of the bases for Pur:Cyt and Pur:Thy pairs are comparatively close to each other and to the energy of interaction in DNA falling to the Ad:Thy pair. The scheme of transitions of standard pairs of bases under the influence of an analog which can replace both purines in a singular molecular form is given as follows:

$$\underset{T_1}{\text{Ad:Thy}} \rightleftarrows \underset{T_2}{\text{M:Thy}} \rightleftarrows \underset{T_3}{\text{M:Cyt}} \rightleftarrows \underset{T_4}{\text{Gua:Cyt}}$$

where M is an analog of adenine and guanine, and T_1, T_2, T_3 and T_4 are the energies of interaction of the bases in DMA falling to the corresponding pairs of bases. The given analogs are potential mutagens which induce the

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USSR

SUKHORUKOV, B. I., et al., Doklady Akademii Nauk SSSR, 1973, Vol 208, No 2, pp 443-446

transitions Ad:Thy→Gua:Thy more frequently than in the reverse direction. Other cases are possible for other ratios between energies. The ratio between these energies determines which base will probably be replaced by the analog, and in which direction this analog will induce transitions.

USSR

UDC: 577.1+541.1

POLTORAK, O. M., Department of Physical Chemistry, Moscow State University

"Acid-Base Mechanisms of the Action of Enzymes Containing Diphosphothiamine and Biotin"

Moscow, Vestnik Moskovskogo Universiteta, Ser. II: Khimiya, Vol 13, No 2, Mar/Apr 72, pp 143-153

Abstract: Acid-base mechanisms of action of enzymes containing DTP and biotin was studied. Although these enzymes have not been extensively studied, their principal intermediate catalysis products are known in general outlines. The chain theory of bond rearrangement indicates elementary processes which take place with the participation of proton acceptors and donors. This theory gives the number of acid-base catalytic groups and their general properties, which can be experimentally verified. The entire set of reactions which take place in the globules of enzymes containing DTP was reduced to five types of conversion reactions involving proton acceptors and donors. These five "canonical" reactions are first examined, and then attention is turned to actual mechanisms of enzymatic processes involving various combinations of these five reactions. Carboxylation reactions in biological systems are examined where the enzymes responsible for the reactions contain biotin as a prosthetic group.

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1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ADSORPTION AND CATALYTIC PROPERTIES OF HEMIN ON CARBON BLACK AND PHOSPHOLIPID SURFACE -U-

AUTHOR-(03)-POLTORAK, O.M., CHUKHRAY, YE.S., VESELOVA, M.N.

COUNTRY OF INFO--USSR

SOURCE--VESTN. MOSK. UNIV., KHIM. 1970. 11(1), 14-17

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PHOSPHOLIPID, CARBON BLACK, ALUMINUM OXIDE, CATALYST ACTIVITY, IRON COMPOUND, ADSORPTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/0453 STEP NO--UR/0189/70/011/001/0014/0017

CIRC ACCESSION NO--AP0128023

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0128023

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ABSORPTION AND CHANGE OF HEMIN CATALYTIC ACTIVITY ON CARBON BLACK AND CARBON BLACK,AL SUB2 O SUB3 SURFACES COVERED PRELIMINARY BY LECITHIN MONOLAYER WERE STUDIED. COORDINATE BINDING OF 2 FE ATOMS RESULTED IN DESTRUCTION OF HEMIN CATALYTIC ACTIVITY. PROTECTION OF THE HEME GROUP BY NONPOLAR RESIDUES, NOT TAKING PART IN COORDINATE BINDING WITH FE ATOMS CAUSED ACTIVATION OF HEMIN.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--CATALYTIC PROPERTIES OF ADSORBED SUCCINATE DEHYDROGENASE -U-

AUTHOR-(02)-CHUKHRAY, YE.S., POLTORAK, O.M.

COUNTRY OF INFO--USSR

SOURCE--VESTN. MOSK. UNIV., KHIM. 1970, 11(1), 10-13

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--SUCCINATE DEHYDROGENASE, HEART MUSCLE, CATALYSIS, ENZYME ACTIVITY, SPECTROPHOTOMETRY, PHOSPHOLIPID, SILICA GEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0250 STEP NO--UR/0189/70/011/001/0010/0013

CIRC ACCESSION NO--AP0120940

UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0120940

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PURIFIED PREPN. ISOLATED FROM SWINE HEART MUSCLE WAS USED TO STUDY CATALYTIC PROPERTIES OF ADSORBED SUCCINATE DEHYDROGENASE. THE ACTIVITY WAS DETD. SPECTROPHOTOMETRICALLY AT 600 M MU IN THE PRESENCE OF 2,6,DICHLOROINDOPHENOL. AS ADSORBENTS PHOSPHOLIPID MONOLAYERS OBTAINED BY ADSORPTION OF CEPHALIN AND LECITHIN ON SILICA GEL AND CARBON BLACK WERE USED. THE PH OPTIMUM FOR THE ACTIVITY OF THE ENZYME ADSORBED ON DIFFERENT ADSORBENTS WAS EXAMD.

UNCLASSIFIED

1/2 007 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--CATALYTIC PROPERTIES OF CYTOCHROME C, ADSORBED ON SILICA GEL AND LIPID SURFACES -U-

AUTHOR-(02)-SHERIYEV, A.V., POLTORAK, O.M.

COUNTRY OF INFO--USSR

SOURCE--VESTN. MOSK. UNIV., KHIM. 1970, 11(1), 18-21

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CATALYSIS, SILICA GEL, CHOLESTEROL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0249 STEP NO--UR/0189/70/011/001/0018/0021

CIRC ACCESSION NO--AP0120939

UNCLASSIFIED

2/2 007 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0120939

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CATALYTIC PROPERTIES OF CYTOCHROME C ADSORBED ON DIFFERENT SURFACES WERE STUDIED. THE RELATIVE ACTIVITIES, CONST. OF PAIR INTERACTIONS AND K SUBML WERE CALCD. THE GREATEST ACTIVITY OF CYTOCHROME C WAS FOUND WHEN ADSORBED ON SIO SUB2 CHOLESTEROL.

UNCLASSIFIED

Luminescence

USSR

UDC 535.371:541.62

POLTORAK, V. A., Moscow State University imeni M. V. Lomonosov, Moscow

"Luminescence and the Possibility of Tautomerism of Actinomycin Antibiotics"

Leningrad, Zhurnal Obshchey Khimii, Vol 43, No 11, Nov 73, pp 2556-2559

Abstract: Study of the photoluminescence in HPh, EtOAc, EtOH, and H_2O of actinomycin D derived from Actinomyces olivobrunneus showed that two tautomeric forms of the actinomycin, I and II, were apparently present, the proportion of which varied depending on the solvent. The tautamerism was presumably due to a difference in the structure of the 2-amino-4,5-dimethyl-3-phenoxazone chromophore group, which had a $-C(=O)-C(NH_2)=$grouping in I (red luminescence, maximum content in HPh) and a $-C(=O)-C(=NH)-$ group in II (yellow luminescence, maximum content in EtOH). Hydrolysis of the actinomycin with HCl resulted in the formation of deaminoactinomycin (replacement of the NH_2 group with OH), which on treatment with Ac_2O yielded acetyldeaminoactinomycin. Elimination of the NH_2 group precluded tautomerism of the latter compound, which showed only red luminescence that varied in intensity depending on the solvent, but no yellow luminescence.

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USSR

UDC 541.67

PIRNAZAROVA, F. N., POLTORAKOV, A. P., and EMANUEL', N. M., Tashkent Polytechnical Institute, Institute of Chemical Physics, Academy of Sciences, USSR

"Cation-Radicals of the Phenothiazine Type of Psychopharmacological Preparations"

Tashkent, Uzbekskiy Khimicheskiy Zhurnal, No 5, 1970, pp 62-65

Abstract: Biological activity of phenothiazine (PT) type of compounds is related to their being in the cation-radical state, which can be achieved by one electron oxidation of PT. A series of PT derivatives and some parent tricyclic structures were investigated by EPR spectroscopy. Analysis of spectral data led to a conclusion that the ability of PT-compounds to form stable cation radicals in acid media is related to the electron donor properties of PT nucleus. Transformation of the PT nucleus or the presence of an electron-accepting carbonyl group in α-position to the nitrogen lowers the electron donating activity of the PT system and consequently their ability to form cation radicals.

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AA0043415

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent, 2/70

243069 SUPERCONDUCTIVE MAGNET PROTECTION against overheating incorporates a superconductive bridge in the same cryostat as the superconductive magnet, but arranged above the latter. When the level of liquid helium in the cryostat falls, the superconductor properties of the bridge are lost and its rising resistance forces a current through the short-circuited external circuit where the accumulated energy of the magnetic field is dissipated.

15.6.67 as 1166083/24-7. B. F. POLTORATSKII. (18.9.69)
Bul 16/5.5.69. Class 21g. Int.Cl. H 01 F.

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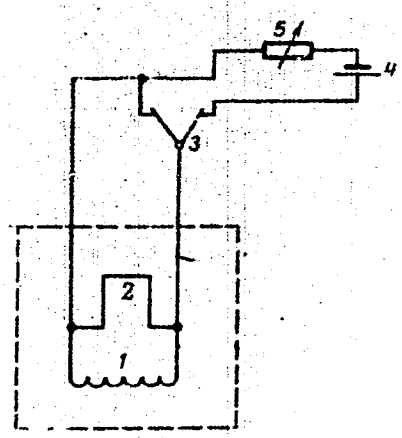
AA0043415



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19761719

USSR UDC 621.391.63

AVTONOMOV, V. A., BORISOV, B. S., GRUDININ, A. S., VARLAMOV, I. V., KANDYBA, Pe, Ye., KOLYASNIKOV, V. A., KRASYUK, B. A., MESKIN, S. S., PETRUSEVICH, V. A., POLTORATSKIY, E. A., RAVICH, V. N., and CHICHERIN, L. A.

"High-Spped Optical-Electronic Switch"

Elektron. tekhnika. Nauch.-tekhn. sb. Mikroelektronika (Electronics Technology. Scientific-Technical Collection. Microelectronics), 1971, Issue 2(28), pp 3-8 (from RZh-Elektronika i yeye primeneniye, No 8, August 1971, Abstract No 8B321)

Translation: An optical-electronic pair is developed, on the basis of which a hybrid microcircuit is produced which assures a high galvanic decoupling and is compatable with respect to the input and output parameters with integrated logic circuits manufactured by domestic industry. 4 ill. 4 ref. Summary.

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USSR

UDC 681.325.65

POLTORATSKIY, E. A., VARLAMOV, I. V., AVTONOMOV, V. A., and OVCHINNIKOV, V. V.

"A Logic Threshold Device"

USSR Author's Certificate No 278751, Filed 5 Jun 69, Published 3 Dec 70 (from Referativnyy Zhurnal -- Avtomatika, Telemekhanika, i Vychislitel'naya Tekhnika, No 8, 1971, Abstract No 8B134 P)

Translation: A logic threshold device is proposed which contains a diode-resistor adder and a discriminator made from a tunnel diode and a transistor. Their purpose is to increase the operational reliability of the device and to expand its logic capabilities. The discriminator contains supplementary photodiodes, and the adder contains electroluminescent diodes and a tunnel diode. The anode and cathode of the tunnel diode are joined to the anodes of the electroluminescent diodes and optically connected with the photo-diodes of the discriminator, whose anodes, in turn, are connected via tunnel diodes to the bases of the transistors.

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USSR

SHAPIRO, YU. L., et al., Poroshkovaya Metallurgiya, No 3, Mar 71, pp 31-35

from -150+100 to -45μ , specific pressure from 1.6 to 15.2 t/cm^2, and holding time from 1 to 8 hours. Specific pressure has the greatest influence on final density of material produced and its grain size. The composition of the steel changes little with extended sintering near the solidus point.

2/2

UDC 669.018.8:621.762

USSR

SHAPIRO, YU. L., POLTORATSKIY, N. I., TITOV, S. G., and BYVSHIKH, M. I., Podol'sk

"Pressing and Vacuum Sintering of Powder of Type Kh18N15 Stainless Steel"

Poroshkovaya Metallurgiya, No 3, Mar 71, pp 31-35

Abstract: In a continuation of earlier works, the authors study the next production batch of austenitic stainless steel powder. The principal properties, cold pressing, melting and isothermal sintering in a vacuum of powder produced by reduction of the oxides with calcium hydride were studied. The larger fractions of the powder had significantly greater specific surface and lower bulk density than the finer fractions, resulting from the complex shape and porosity of the particles. Introduction of a binder decreases and evens the bulk density. Cold pressability increases with decreasing particle size. The powder melts in a vacuum at 1375-1400°C, so vacuum sintering should be performed at 1300°. Final densities of specimens of 70 to 97% can be achieved with sintering at 1300°C by varying powder particle size

USSR

UDC 669.14.018.8:621.762

SHAPIRO, YU. L., POLTORATSKIY, N. I., TITOV, S. G., and BYVSHIKH, M. I., Podol'sk

"Pressing and Vacuum Sintering of Powder of Type Kh18N15 Stainless Steel"

Poroshkovaya Metallurgiya, No 3, Mar 71, pp 31-35

Abstract: In a continuation of earlier works, the authors study the next production batch of austenitic stainless steel powder. The principal properties, cold pressing, melting and isothermal sintering in a vacuum of powder produced by reduction of the oxides with calcium hydride were studied. The larger fractions of the powder had significantly greater specific surface and lower bulk density than the finer fractions, resulting from the complex shape and porosity of the particles. Introduction of a binder decreases and evens the bulk density. Cold pressability increases with decreasing particle size. The powder melts in a vacuum at 1375-1400°C, so vacuum sintering should be performed at 1300°. Final densities of specimens of 70 to 97% can be achieved with sintering at 1300°C by varying powder particle size

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USSR

SHAPIRO, YU. L., et al., Poroshkovaya Metallurgiya, No 3, Mar 71, pp 31-35

from -150+100 to -45μ , specific pressure from 1.6 to 15.2 t/cm^2, and holding time from 1 to 8 hours. Specific pressure has the greatest influence on final density of material produced and its grain size. The composition of the steel changes little with extended sintering near the solidus point.

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1/3 011 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--ECONOMIC PLANNING -U-

AUTHOR-(02)-BOR, M.Z., POLTORYGIN, V.K.

COUNTRY OF INFO--USSR, ITALY

SOURCE--MOSCOW, MYSL', 1969. 165 PP

DATE PUBLISHED-------69

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--ECONOMIC SYSTEM, NATIONAL ECONOMIC PLANNING, INDUSTRIAL PLANNING, BONUS, MATHEMATIC METHOD, INDUSTRIAL MANAGEMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/0966 STEP NO--UR/0000/69/000/000/0001/0165

CIRC ACCESSION NO--AM0116464

UNCLASSIFIED

2/3 011 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AM0116464
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS BOOK IS A COLLECTION OF EIGHT ARTICLES ON SOME ASPECTS OF PLANNING UNDER THE ECONOMIC REFORM. IT IS INTRODUCED BY A CRITICISM OF SOME 'EXTREME' THEORIES OF PLANNING, PARTICULARLY THE THEORY OF THREE CONCEPTS OF PLANNING (S. SHATALIN). ITS MOST PROGRESSIVE STAGE (THEORY OF OPTIMAL PLANNING) IS DISCARDED AS NON MARXIST, AND THE TRADITIONAL CENTRAL PLANNING SYSTEM IS REASSERTED AS THE MOST OPTIMAL ONE. THE ARTICLES, HOWEVER, EMPHASISE SOME NEW ASPECTS OF PLANNING, SUCH AS: BALANCE OF INDIVIDUAL PLANNING INDICATORS (INDICATORS OF QUALITY SHOULD GET MORE SIGNIFICANCE THAN BEFORE); PROPORTIONS OF PLANS ('INTENSIVE' PLANS ARE MORE DESIRABLE THAN SLACK OVER FULFILLED PLANS); PROPORTIONAL SYSTEM OF BONUSES (THE OLD SYSTEM DID NOT ALLOW FOR VARIOUS DEGREES OF POSSIBLE UNDER FULFILMENT); PLANNING AND MANAGEMENT ('MATRIX MANAGEMENT STRUCTURE', COMBINING THEME MANAGEMENT WITH FUNCTIONAL, IS RECOMMENDED); GREATER USE OF EXACT MATHEMATICAL METHODS IN MANAGEMENT, THEIR ADVANTAGES AND DISADVANTAGES (DISREGARD OF HUMAN FACTOR); NEW ASPECTS OF PLANNING IN THE BUILDING INDUSTRIES (PARTICULAR ATTENTION IS PAID TO REDUCING THE NUMBER OF UNFINISHED PROJECTS); LABOUR PRODUCTIVITY (MORE ATTENTION TO PROPORTIONAL DISTRIBUTION OF BONUS FUNDS). THE BOOK ALSO CONTAINS AN INTERESTING PAPER BY POLTORYGIN DEVOTED TO THE PROBLEM, 'WHAT IS A TAUT PLAN?' POLTORYGIN POINTS OUT, INTER ALIA, THAT IF COST CURVES ARE U SHAPED, THEN THE MAXIMUM OUTPUT POINT WILL NOT COINCIDE WITH THE LEAST COST OUTPUT. HE, IN EFFECT, IDENTIFIES A TAUT (NAPRYAZHENNYI) PLAN WITH A LEAST COST PLAN.

UNCLASSIFIED

3/3 011 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AM0116464
ABSTRACT/EXTRACT--THE LAST ARTICLE IS A POLEMIC WITH PIETROMARCHA'S BOOK ON SOVIET ECONOMY; THE SUPERIORITY OF THE SOVIET ECONOMY OVER THAT OF ITALY IS DEMONSTRATED.

UNCLASSIFIED

USSR

UDC 553.216.5(235.222)

POLTORYKHIN, P. I.

"Geological Structural Conditions of Manifestation and Problems of Ore Content of Small Intrusions of the Gold-bearing Kalba"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Geologiya i Razvedka, No 9, 1972, pp 46-50.

Abstract: The geological structural conditions of the folded area including the Altay and Kalba are studied. The zonality of the area can be explained by the deep structure, evolutionary development, migration of material, historic trends of motion and peculiarities of formation of the great geotectonic sections, as well as the peculiarities of tectonics, magmatism, sediment accumulation and other causally related processes. The history of volcanic-intrusive magmatism in the area is traced. Analysis of the available material shows that the gold-bearing deposits of Kalba are polycyclical, closely associated with small intrusions of various ages. In the contemporary erosion section, the upper portions of deeply submerged ore-magmatic columns are primarily exposed, indicating that new ore fields will probably be discovered here and that prospects will be expanded with greater depth at a number of known deposits.

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AT0001548 NUCLEAR SCI. ABST. 0000

10/64

41634 ABSORPTION OF NITROGEN, OXYGEN, HYDROGEN, AND CARBON FROM TECHNICAL HELIUM OR SODIUM IN HIGH-MELTING METALS. Agapova, N. P.; Borodic, W. D.; Poltuchow-skii, A. G.; Taritina, M. I.; Chalkovskii, A. A. (Inst. for Atomic Energy, Moscow). pp 186-91 of Eigenschaften und Anwendung Hochschmelzender und Reaktiver Metalle. Leipzig, Veb Deutscher Verlag fuer Grundstoffindustrie, 1968. (In German).

From Conference on Properties and Uses of Highly Fusible and Reactive Metals, Dresden, Germany. See CONF-670222.

Studies were made on the absorption of oxygen, nitrogen, and hydrogen impurities from technical helium and sodium by Ti, Zr, V, Nb, Ta, Mo, and W at temperatures from 900 to 1100°C. The results showed that the absorption capacity of the metal is dependent on its place in the periodic system. The plasticity of the elements of Group VI B was not altered because of their low gas uptake, whereas the elements of Group IV B were completely embrittled. By addition of alloying elements from Groups IV B, V B, and VI B (about 8 to 10 at.%), the absorption capacity of Nb was altered. Additions of Ti, Zr, or V, which are strongly absorbing metals, increased and additions of W, Mo, or Ta reduced the gas absorption of Nb. Under the same research conditions Ta, Nb, and Nb alloys absorbed more oxygen from He than from liquid Na. (tr-auth)

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UDC: 51:621.391

USSR

POLTYREV, G. Sh.

"Use of Orthogonal Expansions for Transmitting Continuous Messages"

Primeneniye ortogonal'nykh razlozheniy dlya peredachi neprerybnykh soobshcheniy. Nauchn. sovet po kompleksn. probl. "kibernetika". AN SSSR (cf. English above. Scientific Council on the Overall Problem of Cybernetics. Academy of Sciences of the USSR), Moscow, 1970, 30 pp, bibliography of 2 titles (No 2078-70 Dep.) (from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V418 DEP)

Translation: The author compares expansions of random processes in orthogonal series from the standpoint of the quantity of information necessary for transmitting these processes with a given mean square error. Detailed consideration is given to expansions in series of piecewise-continuous functions: square-pulse functions, Haar functions and Walsh functions. Author's abstract.

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1/2 050 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--THE PROBLEM OF ATTENUATION OF LASER RADIATION IN THE ATMOSPHERE -U-

AUTHOR-(04)-SAFRONOV, YU.P., SUKHANOV, YA.A., POLUARSHINOV, V.A., MAKSIUTOV, I.B.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, MAR. 1970, P. 450-454

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, ATMOSPHERIC SCIENCES

TOPIC TAGS--ATTENUATION, LASER RADIATION, ATMOSPHERE, ATMOSPHERIC TRANSPARENCY, HELIUM NEON LASER, AEROSOL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1021 STEP NO--UR/0368/70/012/000/0450/0454

CIRC ACCESSION NO--AP0107535

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202510008-1"

UNCLASSIFIED PROCESSING DATE--30OCT70

2/2 050

CIRC ACCESSION NO--AP0107535

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS OF EXPERIMENTAL STUDIES OF THE FINE STRUCTURE OF THE ATMOSPHERIC SPECTRAL TRANSPARENCY IN VERTICAL DIRECTIONS IN THE RADIATION WAVELENGTH RANGES OF RUBY (6943 A) AND HE-NE (6328 A) LASERS AT VARIOUS ZENITH SIGHTING ANGLES. IT IS SHOWN THAT ATTENUATION OF THE RADIATION OF THESE LASERS OCCURS MAINLY AS A RESULT OF SCATTERING BY GAS MOLECULES AND AEROSOLS. THE TRANSMISSION OF RUBY LASER RADIATION THROUGH THE ENTIRE THICKENSS OF THE ATMOSPHERE AMOUNTS TO A VALUE NO LESS THAN 0.8, WHILE THE CORRESPONDING VALUE FOR AN HE-NE LASER IS 0.6.

UNCLASSIFIED

AT0005878 NUCLEAR SCI. ABST. 11/69 C000

46789 (JINR-P2-4564) FERMI-GUPTA AND SCHWINGER-BLEULER SUBSIDIARY CONDITIONS. Polubarinov, I.V. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1969. 38p. (In Russian). Dep. CFSTI (U. S. Sales Only).

Subsidiary conditions in electrodynamics are analyzed in the interaction and Heisenberg pictures. The effect of the conditions on the elements of S-matrix is investigated, S-matrix being taken both between the infinite and finite times. The work of subsidiary conditions in the quantized Yang–Mills and Einstein theories is briefly considered. The peculiarity of the usual S-matrix due to nonabelian gauge group is discussed. It is stressed that transformed S-matrix, possessing invariance with respect to the additive gauge group, satisfies the physical condition of unitarity. (auth)

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AP9040926 NUCLEAR SCI. ABST. 8/69 0000

32799 (JINR-P2-4362) VARIATIONAL PRINCIPLE AND NONCONSERVED OPERATORS. Polubarinov, I. V. (Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics). 1969. 33p. (In Russian). Dep.

A variational principle is applied to obtain nonconserved operators in field theory. They are induced by infinitesimal transformations under which the Lagrangian is not invariant. As an example the nonconserved operators are found out as well as the equations for them for translations, rotations, conformal and phase shift transformations of one of the fields from the closed system of interacting fields and also for gauge transformations. (auth)

1943 1525

USSR

POLUBOYARINOV, A. K., Leningrad

"On Motion of Shock Front Reflected From a Blunt Body"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, No. 2, March-April, 1971, pp 70-77

Abstract: An exact differential equation is obtained to determine the magnitude of the center of shock front reflected from spherical and cylindrical bodies. The Mach number of the reflected front is used as an independent variable.

The radius of curvature of the reflected front at the axis of symmetry and the derivative of the gas velocity after the front are included in the above equation. The initial values of these quantities are obtained.

Calculated curves of displacement versus time for several values of Mach number are presented and compared to experimental data from other sources.

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UDC 666.763.5:539.374

USSR

BOROVKOVA, L. B., LUKIN, YE. S., and POLUBOYARINOV, D. N., Moscow Institute of Chemical Technology imeni D. I. Mendeleyev

"Change in the Structure and Characteristics of Industrial Aluminosilicate Refractory Materials at Extended High Temperatures"

Moscow, Ogneupory, No 6, 1971, pp 27-30

Abstract: The subjects of the study were metals and the variations in their structure and characteristics produced after long service under high-temperature conditions in air. Made of 38, 62, and 78% Al_2O_3, and designated by type numbers D-B, V-B, and 107, respectively, the metals were produced by the Semiluksk Plant. A short explanation of the preparation of the specimens is given; they were subjected to heating at 1350°C for 25, 100, and 300 hours, and at 1500°C for 25, 50, and 100 hours in air in an oven with carborundum heaters. The microstructure of transparent slices of the metal was studied, and the state of the crystalline phases was determined by x-ray analysis. Results of the observations are given in tabular form. It is concluded that the change in structure of the aluminosilicate speciments is much less than in pure oxide materials, and that the characteristics of the specimens change only slightly under the stress of heat.

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UDC: 541.45:666.3/7:539.4

USSR

ADUSHKIN, L.YE., BAKUNOV, V.S., GUZMAN, I.YA., and POLUBOYARINOV, D.N., Moscow Institute of Chemical Technology imeni D.I. Mendeleyev, Moscow, Ministry of Higher and Secondary Specialized Education RSFSR

"Strength and Deformation of Oxide Ceramics"

Moscow, Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 4, Apr 70, pp 753-760

Abstract: The article considers the effect of grain composition (size of filler grains and the pore size determined by them) on the strength and high-temperature deformation of corundum ceramics. The initial material was commercial G-1 brand alumina. A filler (single-fraction Al_2O_3 powder) and binder (finely dispersed Al_2O_3 precalcined at 1450° C) were used to prepare specimens with different structures (textures). The filler grain size varied from 50 to 1000 microns. The experimental specimens prepared were of practically identical phase composition, microstructure and porosity (~32 percent) and differed only in texture, i. e. the number and size of the pores with an identical pore size distribution character.

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USSR

ADUSHKIN, L. YE., et al., Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 4, Apr 70, pp 753-760

It was found that the strength of porous ceramics (as compared with dense ceramics) is reduced as a result of reduced contact strength, a decrease in the contact cross-section and the stress concentration of the pores. The deformation rate of porous corundum ceramics of granular structure does not depend on the pore size and is ~1-2 orders of magnitude higher than the deformation rate for dense corundum ceramics with corresponding crystal size. In the temperature range under study deformation is determined by the same mechanisms as the deformation of dense materials. The increase observed in the deformation rate is due to an increase in the effective stress which occurs in the material as a result of a decrease in the cross-section and stress concentration. The effect of porosity and pore size on the deformation rate may be considered in the first approximation from the value of the "limiting proportion of the contact cross-section."

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1/2 039 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--DEFORMATION PROPERTIES OF SOME HIGH REFRACTORY MATERIALS AS DEPENDENT ON THE IMPURITY LEVEL -U-

AUTHOR--POLUBOYARINOV, D.N.

COUNTRY OF INFO--USSR

SOURCE--OGNEUPORY 1970, 35(4), 43-6

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CERAMIC MATERIAL, ALUMINUM OXIDE, MAGNESIUM OXIDE, EUTECTIC MIXTURE, KAOLIN, ALUMINA, REFRACTORY MATERIAL, DEFORMATION RATE, IMPURITY LEVEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0620 STEP NO--UR/0131/70/035/004/0043/0046

CIRC ACCESSION NO--AP0134383

UNCLASSIFIED

2/2 039 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134383

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MANY STUDIES HAVE SHOWN THAT A CERTAIN PURITY OF THE MATERIAL IS ESSENTIAL FOR IT TO HAVE THE PROPERTIES REQUIRED. THE EFFECT OF IMPURITIES OF NATURAL RAW MATERIAL ON THE DEFORMATION PROPERTIES OF SEVERAL REFRACTORIES IS DISCUSSED. ON TRANSITION FROM COM. MAGNESITE BRICK OF STD. PURITY TO THE PURER MATERIAL, THE TEMPS. OF THE START OF SOFTENING AND THE 4PERCENT COMPRESSION INCREASE BY 450-600DEGREES. BY COMPARISON, DENSELY SINTERED AND PURE MATERIAL INCREASES BY 650-800DEGREES WITH RESPECT TO THESE PORPERTIES. THE SAME DEPENDENCE OF THE RAW MATERIAL ON THE PURITY IS OBSD. ALSO FOR MULLITE REFRACTORIES. HOWEVER, CERTAIN PROCESSING CONDITIONS OF THE BODIES, AND THE USE OF NATURAL HIGH ALUMINA ALUMINOSILICATES MAKE IT POSSIBLE TO IMPROVE THE DEFORMATION PROPERTIES OF MULLITE. THE SUBSTITUTION OF CLAY BY KAOLIN IN THE MULLITE INCREASES THE TEMP. OF THE VARIOUS DEFORMATION STAGES BY 80-90DEGREES. INCREASING THE IMPURITY CONTENT OF HIGH-D. HIGHLY PURE ALUMINA MATERIAL FROM 0.003 TO 0.2PERCENT INCREASES THE DEFORMATION RATE BY SIMILAR TO 1 ORDER OF MAGNITUDE. IMPURITIES WHICH AT TESTING TEMPS. FORM HIGHLY REFRACTORY COMPDS. DO NOT DECREASE THE DEFORMATION RATE. LOW MELTING EUTECTIC OF AL SUB2 O SUB3 WITH MGO.AL SUB2 O SUB3 FORMS AT SIMILAR TO 1925DEGREES. THUS, EVEN SMALL AMTS. OF IMPURITIES IN A RELATIVELY PURE CERAMIC CONSIDERABLY INCREASE ITS DEFORMATION RATE (CREEP) UNDER LOAD.

FACILITY: MOSK. KHIM.-TEKHNOL. INST. IM. MENDELEEVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 029 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--STRENGTH AND DEFORMATION OF OXIDE CERAMICS -U-

AUTHOR-(04)-ADUSHKIN, L.YE., BAKUNOV, V.S., GUZMAN, I.YA., POLUBOYARINOV, D.N.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(4), 753-60

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--MODEL, CORUNDUM CERAMIC, OXIDE CERAMIC, CERAMIC PRODUCT PROPERTY, POROSITY, MECHANICAL STRENGTH, PLASTIC DEFORMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1447 STEP NO--UR/0363/70/006/004/0753/0760

CIRC ACCESSION NO--AP0130380

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202510008-1"

2/2 029 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130380

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STRENGTH AND DEFORMATION OF MODEL STRUCTURES OF POROUS CORUNDUM CERAMICS OF A GRANULAR CONSTRUCTION WERE INVESTIGATED. AT CONST. COMPN., MICROSTRUCTURE, AND APPARENT D., THE TEST SAMPLES DIFFERED ONLY IN TEXTURE (THE GRAIN SIZE OF THE POLYCRYST. FILLER AND THE PORE SIZE DETD. BY IT). THE STRENGTH OF POROUS CERAMIC (AS COMPARED TO THE DENSE ONE) IS DECREASED DUE TO THE LOWER CONTACT STRENGTH, DECREASED CONTACT CROSS SECTION, AND DECREASED STRESS CONCN. IN THE PORES. THE DEFORMATION RATE OF POROUS CORUNDUM CERAMICS OF GRANULAR CONSTRUCTION DOES NOT DEPEND ON THE PORE SIZE AND IS SIMILAR TO 1-2 AS GREAT AS THE DEFORMATION RATE OF CORUNDUM CERAMICS. AT 1350-1600DEGREES THE DEFORMATIOOF THE STRUCTURE IS DETD. BY THE VERY SAME MECHANICSMS AS THE DEFORMATION OF DENSE MATERIALS. THE OBSD. INCREASE IN THE DEFORMATION RATE IS ASSOCD. WITH THE INCREASE IN THE EFFECTIVE STRESSES ARISING IN THE MATERIAL AS A RESULT OF THE WEAKENING OF THE CROSS SECTION AND THE STRESS CONCNS. THE SUMMARY ACTION OF THE FACTORS INDICATED CAN IN THE 1ST APPROXN. BE CONSIDERED EMPIRICALLY FROM THE VALUE OF THE "LIMITING FRACTION OF THE CONTACT CROSS SECTION".

FACILITY: MOSK. KHIM.-TEKHMOL. INST. IM. MENDELEEVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 013 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--SYNTHESIS OF SILICON OXYNITRIDE -U-

AUTHOR-(04)-GUZMAN, I.YA., PURUSOVA, T.N., POLUBOYARINOV, D.N.,
KARPILOVSKAYA, M.N.
COUNTRY OF INFO--USSR

SOURCE--OGNEUPORY 1970, 35(3), 41-6

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SILICON COMPOUND, NITRIDE, DILATOMETRIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/0879 STEP NO--UR/0131/70/035/003/0041/0046

CIRC ACCESSION NO--AP0118048
UNCLASSIFIED

2/2 013 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118048

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ACCORDING TO THE REACTION SI PLUS SIO SUB2 PLUS N SUB2 EQUALS SI SUB2 ON SUB2 PLUS ONEHALF O SUB2 (1) OR 3SI PLUS SIO SUB2 PLUS 2N SUB2 EQUALS 2SI SUB2 ON SUB2 (2) SYNTHETIC SILICON OXYNITRIDE WAS PREPD. THE THERMOGRAVIMETRIC AND X RAY ANAL. DATA SHOW THAT THE REACTIONS BEGIN AT 1000DEGREES AND FINISH AT 1450DEGREES. REACTION (2) HAS BETTER PROSPECTS FOR USE. TO PROVE THE ASSUMPTION THAT SI SUB2 ON SUB2 IS CREATED VIA THE INTERMEIDATE SIO, SAMPLES FROM A MIXT. SIO PLUS SI IN WT. RATIO 1.52:1 WERE PREPD. AND HEATED IN N AT 1450-70DEGREES. BY X RAYS ONLY THE PHASE SI SUB2 ON SUB2 WAS FOUND. A SLIGHTLY LOWERED WT. INCREASE (IN COMPARISON WITH THE THEORETICAL ONE) IN (2) IS CAUSED BY THE SIO ESCAPE. THE DILATOMETRIC MEASUREMENTS AT 20-700DEGREES OF SMAPLES WITH VARIOUS SI:SIO SUB2 RATIOS CONFIRM THE X RAY DATA. SAMPLES HEATED AT 1350DEGREES AND CONTG. A LARGE AMT. OF SIO SUB2 SHOW THE QUARTZ EFFECT CONNECTED WITH TRANSFORMATION OF BETA TO ALPHA QUARTZ. THE COURSE OF DILATOMETRIC CURVES OF SAMPLES HEATED AT 1450DEGREES DEPENDS ON THE INITIAL COMPN. OF THE MASS. AT SI:SIO SUB2 EQUALS 31.85:65.15 AT 170-280DEGREES THE EFFECT CORRESPONDING TO THE EXISTENCE OF CRISTOBALITE IS CLEARLY SHOWN. THE AV. COEFF. OF THERMAL EXPANSION IF R.EE TIMES 10 PRIME NEGATIVE6 DEGREES. AT A RATIO 58.37:41.63 THE SMOOTHE COURSE OF DILATOMETRIC CURVES IS EVIDENT. THE COEFF. OF THERMAL EXPANSION EQUALS 2.13 TIMES 10 PRIME NEGATIVE6-DEGREE. FACILITY: MOSK. KHIM.-TEKHNOL. INST. IM. MENDELEEVA, MOSCOW, USSR.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--17JUL70

TITLE--TECHNICAL PRODUCTION AND PROPERTIES OF GRANULAR OXIDE REFRACTORIES -U-

AUTHOR--POLUBOYARINOV, D.N., BALKEVICH, V.L., VINOGRADOVA, L.V., LEMESHEV, V.G., MINKOV, O.B.

COUNTRY OF INFO--USSR

SOURCE--OGNEUPORY 1970, 35(1), 11-14

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--REFRACTORY PRODUCT, REFRACTORY MATERIAL, OXIDE, ALUMINA, ZIRCONIUM COMPOUND, MAGNESIUM COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1978/1939 STEP NO--UR/0131/70/035/001/0011/0014

CIRC ACCESSION NO--APOO46628
UNCLASSIFIED

Acc. Nr: AP0046628 Abstracting Service: CHEMICAL ABST: 4/70 Ref. Code: UR 0131

82448a Technological production and properties of granular oxide refractories. Poluboyarinov, D. N.; Balkevich, V. L.; Lemeshev, V. G.; Min'kov, D. B.; Makarova, T. S.; Vinogradova, L. V. (Mosk. Khim.-Tekhnol. Inst. im. Mendeleeva, Moscow, USSR). *Ogneupory* 1970, 35(1), 11-14 (Russ). The technol. of granular oxide refractories is based on the use of coarse-dispersive powders prepd. from presintered or elec. fused oxides. The ruling opinion that coarse-granular powders of pure elec. fused oxides are inert at sintering and that they do not form sufficiently dense and solid ceramics is faulty. If high pressures (1000–2000 kg/cm²) are used, and if the min. amt. of fine-dispersive powders of an oxide is added to the ceramic mass or even no binder is used when the porosity proper for refractories (i.e. 15–20%) is reached at the annealing temps. ordinary for a given oxide. The strength and deformation properties of these products are satisfactory. The deformation temp. of porous granular refractories under load prepd. from pure elec. fused oxides is 50–100% lower than that of nonporous materials. Refractories prepd. from elec. fused oxides show a substantially lower strength, however, sufficient for service at high temps. From the powders of elec. fused oxides one can prep. high-class products comparable in properties with products manufd. from powders of sintered oxides. The main technol. parameters of the manuf. of oxide refractories are practically the

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19781939

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same for both initial materials. The technol. by using sintered oxide powders needs: the preliminary thermal treatment of initial components (Al_2O_3, MgO, ZrO_2), the fine grinding, the briquetting, the annealing of briquets, and their crushing and partial grinding. The elec. fusion permits using raw initial powders; further, it makes possible to realize the stabilization of ZrO_2 with CaO or the synthesis of complicated compds., namely spinels, zirconates, silicates, and other highly fire-resistant substances. J. Jindra

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19781940

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GUZMAN, I. YA., PURUSOVA, T. N., POLUBOYARINOV, D. N., KARPILOVSKAYA, M. N.

"Synthesis of Silicon Oxynitride"

Moscow, Ogneupory, No 3, Mar 70, pp 41-46

Abstract: A refractory material has been produced, consisting primarily of silicon oxynitride (Si_2ON_2); the optimal technological parameters for its synthesis are determined, and certain properties of the materials produced are described.

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Refractory Materials

USSR UDC 666.764.1.001.5

BOROVKOVA, L. B., LUKIN, YE. S., MAYYER, A. A., and POLUBOYARINOV, D. N., Moscow Institute of Chemical Technology imeni I. D. Mendeleyev

"Changes in Structure and Certain Properties of Industrially Made Basic Refractories on Precipitation Hardening"

Moscow, Ogneupory, No 8, 70, pp 27-32

Abstract: Data is presented on changes in the structure of ordinary magnesite (MG-1) and periclase spinel refractories (M-9N, PShS-4) produced at the "Magnezit" plant and on some of their properties following long-term heating at high temperatures. The precipitation hardening was performed at 1350°C for 25, 100, and 300 hours, at 1500°C for 25, 50, and 100 hours and at 1700°C for 25 hours. At 1350 and 1500°C, the heating was done in open air in a furnace equipped with carborundum heaters while at 1700°C -- heating was done in a furnace with graphite heaters in a helium atmosphere. The microstructure of the test material was studied on transparent microsections and the composition of the crystalline phases was analyzed by x-ray phase analysis. Structural patterns

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USSR

BOROVKOVA, L. B., et al., Ogneupory, No 8, 70, pp 27-32

of all three refractories are shown in the original article. The effect of heat treatment on the properties of the refractories was assessed by changes in apparent density, compressive strength, buckling, and creep. Both the strength and refractoriness-under-load showed improvements. The strength of periclase spinel refractories subjected to precipitation hardening at 1350-1700°C decreased, while both buckling and creep deformation were at a level close to that of the initial material.

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USSR

UDC 632.95

POLUBOYARINOVA, I. R.

"Distribution and Quantitative Determination of Herbicides of 2,4-D Acid and of 2,4-D Butyl Ester in Water"

V sb. Probl. analit. khimii, (Collection of Works: Problems of Analytical Chemistry), Vol 2, Moscow, Nauka, 1972, pp 115-117 (from Referativnyy Zhurnal -- Khimiya, Svodnyy Tom, No 23(II), 1972, Abstract No 23N451 by T. A. Belyayeva)

Translation: Thin layer chromatography on silica gel is used for determination of 2,4-D and of butyl ester of 2,4-D in water. One hundred ml. of analyzed water is acidified with 5 ml. of concentrated HCl, and the extraction is carried out with $CHCl_3$ (70, 50, and 50 ml.) shaking the sample for 3 min. The organic layer is extracted with 3% solution of $NaHCO_3$ (70, 50, and 50 ml.). The extract is acidified to pH 2-3 and extraction is carried out with $CHCl_3$ (3 x 50 ml.). The organic solution is evaporated to 1-2 ml., and the residue is subjected to thin layer chromatography on silica gel KSK-2.5 in the system cyclohexane-C_6H_6 - AcOH (10:2:3). The obtained plates are treated with $AgNO_3$ solution and irradiated with UV light for 20-30 min. The concentration of the substance is determined from the area of the spot.

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USSR

UDC 620.193.4

MULYAKAYEV, L. M., DUBININ, G. N., DALISOV, V. B., POLUBOYARTSEVA, L. A., MANTOROVA, T. M., and REYFER, A. A., Moscow Aviation Institute imeni Sergo Ordzhonikidze

"Corrosion Resistance of Diffusion Chrome Plated Steel in Certain Mediums"

Moscow, Zashchita Metallov, Vol 9, No 1, Jan-Feb 73, pp 66-70

Abstract: A study was made of the corrosion behavior of chrome plated steels in a series of industrial aggressive media. Specimens of carbon steels (brands 35 and 45) and of OKh21N5T austenitic-ferritic class steel were chromated according to a technology developed by the Chair of Aviation Science of Metals of Moscow Aviation Institute; their diffusion layer was x-ray-analyzed and its thickness and microhardness measured. Corrosion resistance curves of brand 45 steel before and after diffusion chrome plating at 1100° for 10 hrs show that diffusion chromating protects brand 45 steel against corrosion in a 15% solution of tartaric acid and in a 3% solution of table salt, but does not reliably protect it in a concentrated freon solution widely used in refrigerating plants at operating conditions of 300° and 60 at. Results of corrosion tests under industrial conditions of up to two years duration of brand 35 steel and OKh21N5T steel, chromated and not chromated, are shown. The corrosion rate of brand 35 steel subjected to the action of an aggressive

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USSR

MULYAKAYEV, L. M., et al., Zashchita Metallov, Vol 9, No 1, Jan-Feb 73, pp 66-70

medium for up to 672 hrs with a diffusion coating is ten times lower than without a coating and approximately equal to the corrosion rate of OKh21N5T stainless steel in this medium. The use of a chromated diffusion coating to increase the corrosion resistance of OKh21N5T proved to be of little effect. Two figures, two tables, five bibliographic references.

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USSR

UDC 539.26+539.234

KLOCHKOV, V. P., GRIGOR'YEV, O. N., POLUDIN, V. I., SOLDATENKO, N. N., TORCHUN, N. M., TKHORIK, YU. A.

"Obtaining and Studying the Germanium-Silicon Heterosystem"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No 6, 1971, pp 24-30

Abstract: A study was made of the heteroepitaxial growth and degree of perfection of germanium films deposited from a molecular beam in a vacuum on substrates made of silicon. The previously obtained results for the Ge-GaAs system [A. P. Klimenko, et al., Protsessy rosta i struktura monokristallicheskikh sloyev poluprovodnikov, Part 1, Nauka Press, Novosibirsk, 478, 1968] are presented for comparison. The indicated systems were used as models of heterojunctions in which the semiconductor pairs are either very close with respect to crystallographic parameters (Ge-GaAs) or these parameters are essentially different (Ge-Si). The crystal structure, mechanism of nucleation and growth and structural defects are studied. The mechanism of occurrence of twins in the germanium films on (100) silicon is discussed. On GaAs substrates in the initial stages of nucleation there is a tendency toward the formation of flat (platelike) nuclei, the tangential growth rate of which turns out to be appreciably higher than the normal growth rate. The germanium films have a

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USSR

KLOCHKOV, V. P., et al., Poluprovodnikovaya tekhnika i mikroelektronika, No 6, 1971, pp 24-30

mosaic structure. The data on the angles of disorientation of the films and substrates obtained from the corresponding rocking curves confirm the conclusions obtained from topographic studies: the film growing on the surface of the crystal is not only distorted itself, but it distorts the substrate.

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USSR UDC 539.26+539.432

KLOCHKOV, V. P., GRIGOR'YEV, O. N., POLUDIN, V. I., SOLDATENKO, N. N., TORCHUN, N. M., and TKHORIK, Yu. A.

"Preparing and Investigating Germanium-Silicon Heterosystems"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 6, 1971, pp 24-30

Abstract: Experiments are described for investigating the heteroepitaxial growth and quality of germanium films deposited on silicon substrates by a molecular beam in a vacuum. The results obtained by these experiments are compared with those found earlier in experiments with Ge-GaAs systems used as models of heterojunctions made of semiconductor pairs with very similar crystallographic parameters, such as Ge-GaAs, or very different parameters, such as Ge-Si. The method of diffraction of fast electrons in reflection and electron microscopy, as well as double crystal spectrometry and x-ray topographical pictures by the Berg-Barrett method are used. The temperature of the silicon substrates varied from 240 to 800° C and the condensation rate from 3 to 4000 Å per second. The vacuum was maintained in the limits of 1 to $5 \cdot 10^{-5}$ mm Hg and the film thickness varied from tens of angstroms to tens of microns. The authors are connected with the Semiconductor Institute, Ukrainian Academy of Sciences.

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POLUDIN, V.I.

XIV-8. STUDY OF THE MORPHOLOGY OF THE GROWTH OF EPITAXIAL FILMS BY THE ELECTRON DIFFRACTION METHOD

[Article by V. I. Poludin, S. B. Svechnikov, N. M. Torchun, Yu. A. Tkhorik, Yu. M. Shvedov, Kiev] Novosibirsk, III simpozium po protsessam rosta i svoystvam epitaksial'nykh plenok, Russian, 12-17 June 1972, p 203]

In this paper it was demonstrated that the electron-microscope study of the film surface by the replica method can turn out to be inadequate to obtain unique conclusions regarding the morphology and mechanical growth of a film. The most complete information about the growth process is given by the complex use of electron diffraction and electron microscopy in different stages of growth beginning with thicknesses of several tens of atomic layers. The application of the indicated methods to the study of epitaxial films of germanium on substrates of silicon and gallium arsenide permitted detection of the morphological peculiarities of the film growth.

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USSR

UDC: 621.378.33+535.345.1

ALEKSANYAN, A. G., POLUEKTOV, I. A., POPOV, Yu. M.

"Light Amplification Factor in Heavily Doped Semiconductors"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 2(8), 1972, pp 77-83

Abstract: The coefficient of light amplification is computed for transitions between bands in a semiconductor under conditions of heavy dopant injection. Analytical expressions are found for the Fermi quai-levels of electrons and holes, applicable over a wide range of temperatures and dopant concentrations. The qualitative particulars of the results are discussed. Examples are given of calculation of the laser threshold characteristics for the given type of optical transitions. The authors thank P. G. Yeliseyev for constructive criticism. Two illustrations, bibliography of twelve titles.

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USSR UDC 621.375.82

ALEKSANYAN, A. G., POLUEKTOV, I. A., POPOV, Yu. M.

"Light Amplification Coefficient in Highly Doped Semiconductors"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No. 2, Moscow, "Sov. radio", 1972, pp 77-83 (from RZh-Fizika, No 10, Oct 72, Abstract No 10D987)

Translation: The light amplification coefficient was calculated for interzonal transitions in a semiconductor under conditions of high doping. Analytical expressions were obtained for the Fermi quasi levels of electrons and holes which are applicable over a wide range of temperatures and admixture concentrations. The qualitative features of the results are discussed. Examples of a calculation of laser threshold characteristics for this type of optical transition are given. 12 ref. Authors abstract.

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USSR

UDC 535.345.1

LISOVETS, YU. P., POLUEKTOV, I. A., POPOV, YU. M., ROYTBERG, V. S.

"Passage of a Coherent Ultrashort Light Pulse Through a Semiconductor"

Moscow, Kvantovaya Elektronika, No 5, 1971, pp 28-36

Abstract: Resonance interaction of an ultrashort coherent light pulse with a semiconductor, when the pulse duration is less than the polarization relaxation time or the "phase memory" of the medium, is discussed. The possibility of the existence of the effect of self-transparency under interzone transitions in semiconductors is first considered. This effect means that under certain conditions powerful ultrashort light pulses propagate practically without energy dissipation through an absorbing medium which becomes transparent for them. The medium then consists of a set of "two-level" atoms or molecules which have an allowed dipole transition in resonance with the carrier frequency of the pulse and which interact with one another only through the radiation field. The problem of the interaction of a coherent light pulse with a semiconductor is analyzed in detail, and conditions ensuring the passage of a pulse without energy losses i.e., self-transparency are determined. It is shown that under certain conditions the formation of a steady-state 2π-pulse is possible.

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USSR

LISOVETS, YU. P., et al., Kvantovaya Elektronika, No 5, 1971, pp 28-36

Numerical values of the rate of propagation of a stable pulse are obtained for characteristic values of semiconductor parameters. It is observed that under conditions characteristic of many semiconductors the self-transparency effect is possible in principle, and the stationary pulse that arises can move at a speed that is an order of magnitude less than the ordinary speed of light in the given material.

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USSR

UDC 621.373.5

ALEKSANYAN, A. G., POLUEKTOV, I. A., and POPOV, YU. M.

"The Influence of Impurity Concentration on the Threshold Characteristics of Semiconductor Lasers"

Moscow, Kvantovaya Elektronika, No 3, 1971, pp 15-22

Abstract: This article first summarizes previous research on the stated problem and then proceeds to examine the threshold characteristics of semiconductor lasers as a function of the degree of doping and temperature in the model of optical transitions from the parabolic conduction band to the impurity acceptor band with a gaussian distribution of the state density. The authors have computed the amplification factor and the rate of spontaneous recombination; they also found the dependence of the threshold current, the Fermi quasi-levels, and the generation frequency of the semiconductor laser on the impurity concentration and temperature. Formulas and graphs are used to demonstrate their findings and show the influence of impurity concentration on threshold characteristics. The results obtained in this article may also be used to investigate the threshold characteristics of semiconductor lasers excited optically and electronically. It is necessary only to redefine the meaning of the term Q as the number of electron-hole pairs created

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USSR

ALEKSANYAN, A. G., et al., Kvantovaya Elektronika, No 3, 1971, pp 15-22

per unit of time per unit of volume by extrinsic radiation or the electron beam, respectively, and to connect the value of Q with the extrinsic pumping. The article contains 5 figures and a bibliography of 25 entries.

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USSR

UDC 621.373:520.145.6

NIKITIN, V. Yu., POLUEKTOV, I. A., Editorial Staff of "Fizika i tekhnika poluprovodnikov", Academy of Sciences of the USSR

"On Gain Saturation in Semiconductor Lasers, Masers and Amplifiers"

O nasyshchenii koeffitsiyenta usileniya v poluprovodnikovykh kvantovykh generatorakh i usilitelyakh (cf. English above), Leningrad, 1970, 10 pp, bibl. of 3 titles (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10D150 Dep)

Translation: The authors consider the effect of saturation in semiconductors with regard to the finite time of damping of interband polarization and deformation of the distribution function for nonequilibrium carriers in the presence of an electromagnetic field. An expression is found for the amplification factor with regard to the finiteness of the polarization relaxation time at high field intensities (the saturation effect). An estimate is given of the contribution made by the deformation of the distribution function for nonequilibrium carriers in a strong field to the amplification factor. For fields with $E \geq 10^6$ V/s, $\tau_{ee} \sim 3 \cdot 10^{-13}$ s (τ_{ee} is the collision time for nonequilibrium carriers), this contribution is small and is determined by the expression $10^{-2}\kappa$, where κ is the amplification factor without regard to deformation. Authors' abstract.

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1/2 033 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--KINETICS OF POTASSIUM, RUBIDIUM, AND CESIUM IONIZATION IN AN ACETYLENE AIR FLAME -U-

AUTHOR-(02)-POLUEKTOV, N.S., MESHKOVA, S.B.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(1), 56-9

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--IONIZATION, POTASSIUM, RUBIDIUM, CESIUM, CALCULATION, FLAME

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1221 STEP NO--UR/0076/70/044/001/0056/0059

CIRC ACCESSION NO--AP0128639

UNCLASSIFIED

2/2 033 UNCLASSIFIED PROCESSING DATE--20NOV70
CIRC ACCESSION NO--AP0128639
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEGREE OF IONIZATION OF K, RB, AND CS METALS IN AN ACETYLENE AIR FLAME WAS CALCD. FROM THE DATA OBTAINED BY FOLLOWING THE DEPENDENCE OF INTENSITY OF EMISSION UPON CONC. OF THE METAL ACROSS THE FLAME. THE METALS WERE PRESENT IN CONCN. FROM 10 PRIME NEGATIVE4-10 PRIME NEGATIVE3 MU. THE IONIZATION PROCESS REACHES EQUIL. AFTER 10 MSEC FOR CS WHEREAS K AND RB REQUIRE A LONGER TIME.
FACILITY: INST. OBSHCH. NEORG. KHIM., ODESSA, USSR.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--DETERMINATION OF NEODYMIUM, SAMARIUM, AND EUROPIUM AS IMPURITIES IN LANTHANUM OXIDE BY A LUMINESCENCE OF METHOD -U-

AUTHOR-(03)-POLUEKTOV, N.S., SMIRDOVA, N.I., YEFRYUSHINA, N.P.

COUNTRY OF INFO--USSR

SOURCE--ZH. ANAL KHIM.: 25: 715-18 (APR 1970)

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--LUMINESCENCE, NEODYMIUM, EUROPIUM, SAMARIUM, LANTHANUM OXIDE, CHLORIDE, OXYGEN COMPOUND, METAL CHEMICAL ANALYSIS, FLUORESCENCE SPECTRUM, CRYSTAL PHOSPHOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/0456 STEP NO--UR/0075/70/025/000/0715/0718

CIRC ACCESSION NO--AP0126208

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0126208

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A LUMINESCENCE METHOD HAS BEEN DEVELOPED FOR DETERMINING NEODYMIUM, SAMARIUM, AND EUROPIUM IN LANTHANUM OXIDE OF HIGH PURITY BY RECORDING THE FLUORESCENCE SPECTRA OF CRYSTAL PHOSPHORS BASED ON LANTHANUM OXYCHLORIDE. THE SENSITIVITY OF THE METHOD IS N TIMES 10 PRIME NEGATIVE5 TO N TIMES 10 PRIME NEGATIVE4PERCENT.

FACILITY: INST. OF GENERAL AND INORGANIC CHEMISTRY, ODESSA.

UNCLASSIFIED

1/2 006 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--MIXED COMPLEXES OF RARE EARTH ELEMENTS WITH 5,7,DIBROMO,8,HYDROXYQUINOLINE, 1,10,PHENANTHROLINE, OR

AUTHOR-(03)-POLUEKTOV, N.S., MISHCHENKO, V.T., LAUYER, R.S.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(4), 988-92

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--RARE EARTH COMPOUND, COMPLEX COMPOUND, HYDROXYL RADICAL, QUINOLINE, PHENANTHROLINE, NEODYMIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1201 STEP NO--UR/0078/70/015/004/0988/0992

CIRC ACCESSION NO--AP0128619

UNCLASSIFIED

2/2 009 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0128619

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RARE EARTH METAL IONS (M) FORM 8,COORDINATE COMPLEXES WITH 5,7,DIBROMO,8,HYDROXYQUINOLINE (HA), 1,10,PHENANTHROLINE (PHEN) AND DIPHENYLGUANADINE (L) OF THE COMPN. (MA SUB3 (PHEN)) AND (MA SUB4) HL. H(MA SUB4) AND NH SUB4 (MA SUB4) FORMED AT PH GREATER THAN OR EQUAL TO 8.5 IN THE ABSENCE OF 1,10,PHENANTHROLINE AND DIPHENYLGUANIDINE OR IN THE CASE OF M EQUALS ND IN THE PRESENCE OF 1,10,PHENANTHROLINE. FACILITY: LAB., INST. OBSHCH. NEORG. KHIM., ODESSA, USSR.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--MIXED COMPLEXES OF THE RARE EARTH ELEMENT IONS WITH O,DIHYDROXYCHROMENOLS AND 2,THENOYLTRIFLUOROACETONE AND THEIR USE IN

AUTHOR-(03)-POLUEKTOV, N.S., SANDU, M.A., LAUYER, R.S.

COUNTRY OF INFO--USSR

SOURCE--ZH. ANAL. KHIM.; 25: 899-903 (MAY 1970)

DATE PUBLISHED----MAY70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--METAL COMPLEX COMPOUND, RARE EARTH COMPOUND, ORGANIC COMPLEX COMPOUND, FLUORINATED ORGANIC COMPOUND, ACETONE, BENZENE, SOLVENT EXTRACTION, PHOTOMETRIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/1179 STEP NO--UR/0075/70/025/000/0899/0903

CIRC ACCESSION NO--AP0138194

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 026

CIRC ACCESSION NO--AP0138194

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IONS OF RARE EARTH ELEMENTS FORM MIXED COMPLEX COMPOUNDS WITH THE REAGENTS OF THE DIHYDROXYCHROMENOL GROUP WITH 2 THENOYLTRIFLUOROACETONE, WHICH CAN BY EXTRACTED WITH BENZENE. THE COMPOSIITON AND PROPERTIES OF THE COMPOUNDS FORMED WERE STUDIED. AN EXTRACTION PHOTOMETRIC METHOD WAS DEVELOPED FOR DETERMINING YTTRIUM (OR ANY OTHER ELEMENT OF THE YTTRIUM SUBGROUP) IN THE PRESENCE OF LANTHANUM. FACILITY: INST. OF GENERAL AND INORGANIC CHEMISTRY, ODESSA.

UNCLASSIFIED

1/2 016 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ATOMIC FLUORESCENT DETERMINATION OF MERCURY -U-

AUTHOR-(03)-VITKUN, R.A., POLUEKTOV, N.S., ZELYUKOVA, YU.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. ANAL. KHIM. 1970, 25(3), 474-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--MERCURY, METAL CHEMICAL ANALYSIS, FLUORESCENCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1058 STEP NO--UR/0075/70/025/003/0474/0478

CIRC ACCESSION NO--AP0123051

UNCLASSIFIED

2/2 016 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123051

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN AT. FLUORESCENT METHOD WAS DEVELOPED FOR HG DETN. BY USING A LOW TEMP. FLAME OBTAINED WITH A C SUB3 H SUB8-C SUB4 H SUB10 AND AIR MIXT. USING THE REDN. OF HG TO METAL DURING ATOMIZATION. THE SENSITIVITY OF HG DETN. IS 0.002 MUG-ML AT A CONFIDENCE LEVEL OF 95PERCENT. THE EFFECT OF ORG. SOLVENTS, ANIONS, CATIONS, AND ELEMENTS REDUCED TO THEIR ELEMENTAL STATE IN THE PRESENCE OF SNCL SUB2 WAS STUDIED. IN THE ABSENCE OF SNCL SUB2 FLUORESCENCE INTENSITY OF HG IN THE FLAME DECREASES BY 2 ORDERS; GREATER THAN OR EQUAL TO 5N H SUB3 PO SUB4, GREATER THAN OR EQUAL TO 2N H SUB2 SO SUB4 AND HCLO SUB4 AFFECT THE FLUORESCENCE INTENSITY; HOAC, HNO SUB3, AND HCL (1N) AND 0.5N HBR DECREASE THE INTENSITY. S PRIME2NEGATIVE MUST BE ABSENT DURING HG DETN. LI, NA, K, CS, CU, IN, BE, MG, CA, SR, BA, ZN, CD, AL, ZR, PB, V, BI, MO, W, MN, FE, AND CO, 5 MG-ML, DO NOT AFFECT THE DETN. OF 0.5 MUG HG-ML; 50 MUG AU, PT, CR(VI), AND 0.5 MG AG ALL IN 1 ML INTERFERE IN THE DETN. OF 1 MG HG-ML. FACILITY: LAB., INST. GEN. INORG. CHEM., ODESSA, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--REACTION OF NEODYMIUM AND ERBIUM IONS WITH POLYHYDRIC ALCOHOLS AND ASCORBIC ACID -U-
AUTHOR-(02)-POLUEKTOV, N.S., YEFRYUSHINA, N.P.

COUNTRY OF INFO--USSR

SOURCE--UKR. KHIM. ZH. 1970, 36(2), 164-9

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--NEODYMIUM, ERBIUM, ION, SPECTROPHOTOMETRIC ANALYSIS, RARE EARTH METAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1920 STEP NO--UR/0073/70/036/002/0164/0169

CIRC ACCESSION NO--AP0118882
UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118882

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE 2:1 ND PRIME3 POSITIVE SORBITOL COMPLEX FORMED AT IONIC STRENGTH 0.3 INVOLVES DISPLACEMENT OF 4 ATOMS OF H FROM THE ALC. THE NEG. LOG OF THE FORMATION CONST. IS 24.85 ACCORDING TO SPECTROPHOTOMETRIC DETNS. THE COMPLEX IS A CATION. THE PK OF FORMATION OF THE ER PRIME3 POSITIVE SORBITOL COMPLEX IS 20.71. ND(OH) PRIME2 POSITIVE AND ER(OH) PRIME2 POSITIVE ALSO FORM 2:1 COMPLEXES WHICH INVOLVE DISPLACEMENT OF 2 ATOMS OF H. THE PK OF FORMATION ARE 8.01 AND 4.78, RESP. MANNITOL AND INOSITOL BEHAVE SIMILARLY. THE 1:1 COMPLEXES FORMED BY ND PRIME3 POSITIVE AND ER PRIME3 POSITIVE WITH ASCORBATE ION (HA PRIME NEGATIVE) INVOLVE THE DISPLACEMENT OF 1 H ATOM. THE REPORTED FORMATION CONSTS. OF MA FROM M PRIME3 POSITIVE AND A PRIME2 NEGATIVE ARE 4.5 TIMES 10 PRIME8 AND 1.07 TIMES 10 PRIME9 FOR ND AND ER, RESP. FACILITY: LAB., INST. OBSHCH. NEORG. KHIM., ODESSA, USSR.

UNCLASSIFIED

USSR

DOBRZHANSKIY, G. F., KITAYEVA, V. F., KULEVSKIY, L. A., POLIVANOV, YU. N., POLUEKTOV, S. N., PROKHOROV, A. M., SOBOLEV, N. N., Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR

"Spontaneous Parametric Radiation of the α-HIO_3 Crystal"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No. 11, 5 Dec 70, pp 505-508

Abstract: The first observation of spontaneous parametric radiation in the biaxial crystal α-HIO_3 belonging to class 222 of the rhombic system is recorded. It is noted that if a crystal having quadratic nonlinearity is exposed to a laser beam, there is a probability of a laser photon with frequency ω_H spontaneously decaying into two photons: a photon of the signal frequency ω_1 and a photon of an additional frequency ω_2 so that

$$\omega_H = \omega_1 + \omega_2.$$

The frequencies of the spontaneous parametric radiation ω_1 and ω_2 are determined by the dispersion characteristics of the crystal, since the process is effective if

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USSR

DOBRZHANSKIY, G. F., et al, Pis'ma v Zhurnal eksperimental'noy i teoreticheskoy Fiziki, No. 11, 5 Dec 70, pp 505-508

the following condition is fulfilled:

$$k_H = k_1 + k_2,$$

where k_H, k_1, and k_2 are the wave vectors of the pumping and of the signal and additional waves. The phenomenon is termed particularly interesting, since it is observed even at pumping powers too small to excite parametric generation, and in the absence of a resonator it can be used to obtain angular, temperature, and electrooptical curves of active media suitable for use in parametric generators of light. The α-HIO_3 crystal was transparent in the region 0.4-1.4 μ and had high nonlinear constants. No optical inhomogeneities were observed in the refractive index under the action of optical radiation of high power density, a feature very important in developing parametric generators of light. A continuous argon laser with wavelengths λ_{H_1} = 4880 Å and λ_{H_2} = 5145 Å with an output power of up to 1 w on each of the wavelengths was used for pumping. Parametric radiation arising in the crystal and polarized along the Y-axis was recorded in the direction of pumping propagation. Typical spectrograms of the spontaneous parametric radiation signal are given which illustrate the dependence of the signal frequency ω_1 on the direction of propagation of pumping in the crystal. It was noted that such crystals can be used as a material to produce both pulsed and continuous parametric generators tuned in the region 0.6-1.3 μ.

2/2

USSR

UDC: 8.74

ZUBER, I. Ye., KOLKER, Yu. I., POLUEKTOV, R. A.

"Control of the Numbers and Age Composition of Populations"

V sb. Probl. kibernetiki (Problems of Cybernetics--collection of works), vyp. 25, Moscow, "Nauka", 1972, pp 129-138 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V600)

Translation: Bisexual populations are examined with regard to the age distribution of individuals. It is shown that the dynamic particulars of a bisexual population are related to characteristic parameters of individuals of the female sex. Males play a subordinate role in the model. Variation in the numbers and age structure of the population is completely determined by the nature of the variation in the age structure of the population of female individuals in time. Authors' abstract.

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1/2 032 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--KINETICS AND MECHANISM OF HEXACHLOROBUTADIENE OXIDATION -U-

AUTHOR-(02)-POLUEKTOV, V.A., AGEYEV, N.G.

COUNTRY OF INFO--USSR

SOURCE--KINET. KATAL. 1970, 11(3), 588-94

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--REACTION KINETICS, CHAIN REACTION, BUTADIENE, CHLORINATED ORGANIC COMPOUND, ACTIVATION ENERGY, OXIDATION, ETHYLENE, ELECTRON DENSITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605012/D03 STEP NO--UR/0195/70/011/003/0588/0594

CIRC ACCESSION NO--AP0140287

UNCLASSIFIED

2/2 032 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140287

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT 120-200DEGREES, OXIDN. OF C SUB4 CL SUB6 PROCEEDS BY CHAIN MECHANISM SHOWING A RATE MAX. AT 170DEGREES. APPARENT ACTIVATION ENERGY AT THE OPTIMAL CONDITONS IS 20.6 KCAL-MOLE. REACTION PRODUCTS INHIBIT OXIDN. RATE AT HIGHER THAN 50PERCENT C SUB2 CL SUB6 CONVERSION. PI ELECTRON D., BOND ORDERS, AND INDEXES OF FREE VALENCE OF C SUB4 CL SUB6 ARE CALCD. BY LCAO MO AND ARE TABULATED. THE CALCN. INDICATES THAT CHLORINATED ETHYLENES ARE MORE REACTIVE THAN C SUB4 CL SUB6. FACILITY: FIZ.-KHIM. INST. IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

UDC 591.484:578.088.5

USSR

SIMAKOV, Yu. G., POLUEKTOVA, L. M., and POPOV, V. V., Moscow State University imeni M. V. Lomonosov

"The Effect of Laser Radiation on the Lipid Content of the Frog Crystalline Lens"

Moscow, Izvestiya Akademii Nauk SSSR, Seriye Biologicheskaya, No 4, 1970, pp 609-610

Abstract: Exposure of frog eyes to a focused laser beam (10,600 Å, 0.12 to 0.18 j) produced lamellar cataracts in one-third of the eyes within 48 hours. By the 7th day half of the irradiated eyes had total cataracts. On the third day the cinnamon-brown cortex had acquired a bluish hue, indicating increased lipid content in the affected lens. By the 11th day the cataract-type changes ceased, but the lipids continued to be redistributed, accumulating mostly in vacuoles in affected areas of the lens. By this time the color of the cortex and nucleus was a uniform grayish-blue cataracts did not develop in the eyes of frogs irradiated with 0.04 j, and the lipid content increased only in the areas primarily affected (posterior pole and equator of the lens).

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Acc. Nr: AP0038113 Ref. Code: UR 0326

PRIMARY SOURCE: Fiziologiya Rasteniy, 1970, Vol 17, Nr 1, pp 112-115

INVESTIGATION OF EXCHANGE OF HEAVY OXYGEN WATER IN TISSUES OF IRRADIATED PLANTS

Budnitskaya, Ye. V.; Poluektova, L. N.

A. N. Bakh Institute of Biochemistry, USSR Academy of Sciences, Moscow

Permeability of H_2O^{18} in normal bean leaves irradiated by X-rays is studied with a mass-spectrometer. The exchangeability of water involved in metabolism of the plants was higher in irradiated leaves.

REEL/FRAME
19731164

USSR

SIMONOV, V. D., GERASIMOVA, A. I., POLUEKTOVA, Z. M., et al.,

"Analytical Method for the Reaction Mixture of the Condensation Stage in Production of Phenoxyacetic Acid"

V sb Khim. sredstva zashchity rast. (Chemical Plant Protective Agents) Moscow vyp 3, 1973, pp 144-148 (from RZh-Khimiya, No 20, Oct 73, Abstract No 20N520)

Translation: The quantitative determination method for phenol (I) and phenoxyacetic acid (II) is based on potentiometric titration in a nonaqueous medium. Initially I and II are extracted from the reaction mixture by a solvent mixture of Et_2O and dibutylphtallate (85:15). DMFA was the best solvent for the titration, the titrating agent consisted of 0.1 N solution of tetraethylammonium hydroxide in isopropyl alcohol. A blank run performed under analogous conditions determined the content of free amines present in DMFA. The relative error in determining II in artificial mixtures is ± 1%, of the phenol + 7%.

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USSR

KOLOMENSKIY, A. A.; POLUKHIN, A. T.

"Effect of the Space Charge on the Stability of Betatron Oscillations in Cyclic Accelerators"

Moscow, Atomnaya Energiya; November, 1970; pp 352-6

ABSTRACT: A theoretical investigation concerning the effect of an accelerated beam space charge on betatron oscillation stability in the vicinity of parametric and combination resonances is presented. Corresponding self-consistent equations are solved approximately by means of the asymptotic averaging method. Criteria are found for evaluating the permissible space charge. It is shown that this charge can, in principle, lead not only to increasing but also to decreasing betatron oscillation amplitudes. An investigation is made of the specific instability which can arise due to coupling between transverse and longitudinal oscillations through the space charge.

The article includes 26 equations and two figures. There are 6 references.

Superalloys

USSR

UDC 669.14.018.45-13:621.771.0.14:539.374

GUN, G. YA., POLUKHIN, P. I., SKUGOREV, V. S., GALKIN, A. M., ZHUCHIN, V. N., ISAYEV, V. A., KARLOV, S. V., and ZAPOROZHTSEV, YU. V., Moscow Institute of Steel and Alloys

"Investigation of the Resistance to Deformation and the Indicators of Plasticity of Heat-Resistant Alloys on a Nickel Base"

Moscow, Izvestiya VUZ, Chernaya Metallurgiya, No 11, 1973, pp 92-97

Abstract: In this article the authors cite the results of an investigation on resistance to deformation of heat-resistant alloys EP199, EP220, and EI929 on a nickel base in wide temperature range and deformation rate. They have constructed curves for the change in the indicators of plasticity in a broad range of temperature-rate conditions of deformation.

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USSR

GUN, G. YA., et al., Izvestiya VUZ, Chernaya Metallurgiya, No 11, 1973, pp 92-97

The research was carried out because of the reality at the present time for knowledge of the behavior of materials with respect to resistance to deformation and indicators of plasticity in a range that varies broadly for the temperature and rate of deformation.

The first three illustrations depict curves of deformation resistance of the above alloys as a function of the size and amount of deformation at various temperatures. The fourth figure shows change in values of ψ and δ of these heat-resistant alloys as a function of temperature and rate of deformation.

The article contains four illustrations and 3 bibliographic references.

2/2

USSR UDC 621.774.3

TSELIKOV, A. I., BONDARENKO, YE. S., POLUKHIN, P. I., and POTAPOV, I. N.,

"Development and Wide Introduction of New Technological Processes and Tube-Rolling Mills With Helical Motion for the Production of Hot-Rolled Tubes"

Moscow, Stal', No 12, 1972, pp 1107-1111

Abstract: Production of large-diameter tubes and equipment used during production processes are reviewed. The design and production of new mills capable of accepting material at a feeding angle of 14-15 or 15-17° has made Soviet production of tubes the most advanced in the world. Introduction of two-roll and three-roll mills will further increase the production of tubes while decreasing their cost. A schematic diagram of a two-roll mill is presented. Application of new technology at several metallurgical plants in the Urals region is discussed in broad terms. The emphasis is on increasing the feeding angles of the tube metal. Three-roll mills are planned for 1973, which will increase production effectiveness by 1.8-2.0 times. Mechanical properties of tubes produced at high feeding angles are discussed.

1/1

Forming

UDC: 621.771.0

USSR

POLUKHIN, P.I., VORONTSOV, V.K., CHICHENEV, N.A., and ZOTOV, V.F., Moscow Institute of Steel and Alloys

"Study of Plastic Flow by the Moire Method"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 5, 1970, pp 73-76

Abstract: In a study of plastic flow by the Moire method, the scratches left on the metal after its machining with a planer were used as the initial grid. The selection of the direction and spacing of the initial grid depends on the purpose of the investigation. A lead specimen made of two halves on whose inner surfaces scratches were etched was used in the study. Detailed information was obtained on metal displacements and deformations in the central zone of the specimen and in the region in front of the geometric area of deformation. In the presence of any two Moire patterns, displacements at any point of the factual area of deformation can be determined from a geometric interpretation of the Moire streaks. Equations for the calculation of horizontal and vertical displacements are presented.

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1/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--CALCULATING THE THERMAL EFFECT OF PLASTIC DEFORMATION IN HIGH VELOCITY TESTS -U-

AUTHOR-(04)-POLUKHIN, P.I., GUN, G.YA., SHCHERBIL, R.D., GALKIN, A.M.

COUNTRY OF INFO--USSR

SOURCE--IZVEST. AKAD. NAUK SSSR, METALLY, MAR.-APR. 1970 (2), 171-175

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--PLASTIC DEFORMATION, THERMAL EFFECT, ALUMINUM ALLOY, MATHEMATIC EXPRESSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1163 STEP NO--UR/0370/70/000/002/0171/0175

CIRC ACCESSION NO--AP0130191

UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130191

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMAL EFFECTS RESULTING FROM HIGH SPEED PLASTIC DEFORMATION (UPSETTING) OF CYLINDRICAL METAL PARTS ARE DISCUSSED THEORETICALLY. THE TEMP. DISTRIBUTION IN SUCH SAMPLES DIFFERS ONLY SLIGHTLY FROM THAT ASSOCIATED WITH ADIABATIC DEFORMATION. FOR LOW DEFORMATION VELOCITIES THE TEMP. FIELD IS NONUNIFORM. NUMERICAL SOLUTION OF THE EQUATIONS GOVERNING THESE CHANGES TENDS TO MAKE THE SAMPLE TEMP., IN GENERAL, TOO HIGH. IN THE CASE OF THE COMPRESSION OF AL ALLOYS, IN PARTICULAR, THE THERMAL EFFECTS MAY GIVE A FALSE IMPRESSION OF THE DEFORMATION RESISTANCE.

UNCLASSIFIED

USSR

UDC 620.171.5

VORONTSOV, V. K., POLUKHIN, P. I., and BEREZIN, M. V.

"A Method for Investigating Plastic Flow in Metal"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No. 64, "Metallurgiya," 1970, pp 241-245

Translation: The polarization-optical method of investigating plastic flow of metals, using optically sensitive codings based on polyurethane resins, is proposed. It is proved that the size of deformation differences in the Euler conception may reach 2.4 and more. Pictures of isochromes, moire, and coordinate grids for a shaft compressed under conditions of flat deformation between flat plates are presented. On the basis of experimental data, a diagram is constructed of the relationship between the set of isochromes and the difference in deformations. The existence of a linear dependency between the optical effect and the variety of Euler (or LeGrange) deformations to a value of 1-1.2 is proved. Three figures and two bibliographic entries.

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USSR

UDC 620.171.5

VORONTSOV, V. K., and POLUKHIN, P. I.

"On the Distribution of Stresses According to Data from Optically Sensitive Codings"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 232-237

Translation: An evaluation is made of the precision of an approximate method for dividing stresses according to data obtained by the optically sensitive coding method. It is proposed that a generalized curve be used in the coordinates — maximal tangential stress-maximal shift, where the latter value (generally unknown) is replaced by the difference in deformations in the plane of the optically sensitive coding. The area of application of the approximate method is established. Error in determining the components of stresses in the allowable area of ratios of primary deformations in the plane of the optically sensitive coding is not more than 3-8%. It is proposed that the optical method be used as a zero approximation. On this basis, a method for subsequent approximations is proposed. Five figures and four bibliographic entries.

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USSR

UDC 620.171.5

POLUKHIN, P. I., VORONTSOV, V. K., MOSHKOV, V. I., and PETROV, V. A.

"Stress-Deformation State of a Round Billet During Drawing by Flat, Combined, and Cut Hammer Blocks"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 199-205

Translation: Using the optically sensitive coding method, a comparison was made of the stress-deformed state of round billets during drawing by flat, combined, and cut hammer blocks. It is shown that the use of combined and cut hammer blocks in forging round ingots is more expedient. The article gives practical recommendations on the selection of cut hammer blocks. Six figures and five bibliographic entries.

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USSR

UDC 620.171.5

POLUKHIN, P. I., VORONTSOV, V. K., and CHICHENEV, N. A.

"Determining Deformation Components According to Data from the Moire and Optically Sensitive Codings Methods"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 237-241

Translation: It is proposed that two methods, the moire and optically sensitive coding methods, be used jointly to divide deformations. Cases of flat deformation and flat stress condition are considered, and computation formulas for various particular instances are derived. Twenty bibliographic entries.

1/1

USSR

UDC 621.771

POLUKHIN, V. P., YEFIMENKO, S. P., NIKOLAYEV, V. A., POLUKHIN, P. I., SOLOGUB, V. L., and DUNAYEVSKIY, V. I.

"On the Question of Optimal Conditions for Operating the Rolls of Cold Rolling Mills"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No 64, 1970, pp 53-63

Translation: The article gives recommendations for situating the rolls on the stands, evaluates the degree of built-up metal danger, and offers steps to restore working rolls damaged during the operating process. A new generalized criterion of hardness is proposed which makes it possible to evaluate conditions of roll manufacture and causes of service failures in them. Four illustrations and two tables.

1/1

USSR

UDC 621.771.016

POLUKHIN, V. P., POLUKHIN, P. I., KHLOPONIN, V. N., and PODYMOV, V. F.

"An Analysis of Conditions during Cold Rolling of Low-Carbon Steel."

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No 64, 1970, pp 29-33

Translation: Using a mathematical model of the sheet rolling process on a Minsk-22 computer, investigations were carried out of the power parameters of cold rolling low-carbon 08kp steel. A nomogram was obtained which describes the effective area of rolling under the given conditions. The substantial influence of elastic compression of the rolls on the rigidity of the rolling stand is demonstrated. Results from the study are compared with results which describe cold rolling of stainless steel. Two illustrations and five bibliographic entries.

1/1

USSR

UDC 621.771.28

POTAPOV, I. N., POLUKHIN, P. I., BONDARENKO, Ye. S., YAMPOL'SKIY, V. M., FINAGIN, P. M., and TARTAKOVSKIY, Ye. K.

"Creating High Productivity Cross-Screw Pipe Rolling Mills"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 163-171

Translation: Information is given on the designs of individual and group drives of mills, two- and three-roll working stands, and forward and rear mill tables. Industrial introduction of these designs made it possible to implement new rolling conditions which resulted in a significant rise in the productivity of pipe rolling machines and in improvement in the quality of sleeves and pipes. Five figures and 13 bibliographic entries.

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USSR

UDC 621.771.28.001.5

POLUKHIN, P. I., POTAPOV, I. N., FINAGIN, P. M., and SHEYKH-ALI, A. D.

"Theoretical Developmental Work on the Rolling Process in the Area of Large Feeding Angles"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 158-163

Translation: A theoretical study of the process of cross-screw rolling at large feeding angles is made. It is noted that, in this case, the process has specific features which require a new approach to calibrating the tool and adjusting the mill. Two figures.

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USSR

UDC 621.771.28.001.5

POLUKHIN, P. I., POTAPOV, I. N., FINAGIN, P. M., and SHEYKH-ALI, A. D.

"An Investigation of Speed Conditions of the Piercing Process in the Area of Increased Feeding Angles and the Quality of Pipes"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 136-142

Translation: The article gives results of experimental investigations conducted on the TPAZO-102 tube-piercing mill of speed conditions of the piercing process with large feeding angles. A significant decrease in machine piercing time with an increase in the feeding angle is established. New conditions for the piercing process are developed which made it possible to improve the quality of sleeves and pipes in terms of surface condition and geometric conditions. Six figures and one table.

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USSR

UDC 621.771.28.001.5

POLUKHIN, P. I., POTAPOV, I. N., FINAGIN, P. M., and SHEYKH-ALI, A. D.

"An Investigation of the Piercing Process on the 30-102-Type Rolling Aggregate"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 130-136

Translation: The article gives results of experimental investigations made on the TPAZO-102 tube-piercing mill of the power parameters of the piercing process in the area of large feeding angles. Measurements are made of the full pressure of the metal on the rolls, the force on the mandrel, the torsional moments, and the piercing power. The data obtained may be used in designing and calculating modern-type rolling aggregates. Six figures.

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USSR

UDC 621.771.35.001.15

POLUKHIN, P. I., GOLUBCHIK, R. M., MILENNYY, K. F., and SVISTURNOV, Ye. A.

"Specific Normal Pressures and Specific Friction Forces During Cross Rolling on Multiroll Mills"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 278-281

Translation: On the basis of distribution curves for specific normal pressures and specific friction forces in the contact zone between lead test pieces and the roll, a comparison is made for the first time of the power conditions of rolling on two-, three-, and four-roll mills. The dependencies of average specific normal pressure and full metal pressure against the roll on reduction are obtained as a function of the number of working rolls. It is shown, from an analysis of the curves of specific friction forces, that adopting an average value of friction forces for the entire arc of contact instead of considering average values of specific friction forces in the zones of lag and advance decreases the amount of power on the roll. Five figures and ten bibliographic entries.

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USSR

UDC 621.771.35.001.5

POLUKHIN, P. I., GOLUBCHIK, R. M., MILENNYY, K. F., and BLOKHIN, V. V.

"Metal Slip During Cross Rolling in Mills With Various Numbers of Working Rolls"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 142-146

Translation: The article makes a comparison of the kinematic parameters of cross rolling with various numbers of working rolls. The effectiveness of the particular rolling diagrams for different unit reductions is determined from a consideration of the efficiency in the roll barrel using experimental data. Four figures and six bibliographic entries.

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USSR

UDC 621.771.35.001.5

RYMOV, V. A., POLUKHIN, P. I., ISAYEV, L. M., VATKIN, Yu. Ya., and NEMTSOV, A. S.

"Determining the Basic Parameters of the Process of Continuous, Roll-Less Shaping of Skelp"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 152-158

Translation: Proceeding from the condition of continuity of the deformation area, the basic parameters of the process of roll-less shaping of skelp are found: the work of shaping; the length of the deflecting area; the traction force of the circular-pass stands; and their drive power. Two figures and three bibliographic entries.

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USSR

UDC 621.771.35.001.15

GOLUBCHIK, R. M., POLUKHIN, P. I., MILENNYY, K. F., and BLOKHIN, V. V.

"Theoretical Questions of the Kinematics of the Process of Cross Rolling"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 146-152

Translation: Metal forming during cross rolling is considered, formulas for the components of the power balance are derived, and an expression is obtained for calculating the efficiency in the roll barrels. Conditions of skidding and minimal efficiency are shown as a function of the parameters of the process. Five figures and seven bibliographic entries.

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USSR

UDC: 621.771.073.001.5

KOSARIMOV, Ye. N., POLUKHIN, P. I., and ZINOV'YEV, A. V.

"A Calculation of the Distribution of Inter-Roll Pressure on Four-High Sheet Rolling Mills with Anti-Bend Feature in Working Rolls"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No 64, 1970, pp 63-68

Translation: A method is proposed for calculating the inter-roll pressure when rolling on a four-high mill with unshaped working and backup rolls using the force of a positive bend between the roll necks. A comparison is made between calculated and experimental data which demonstrates that their convergence is satisfactory. Three illustrations.

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